Updates on PHG4KalmanPatRec

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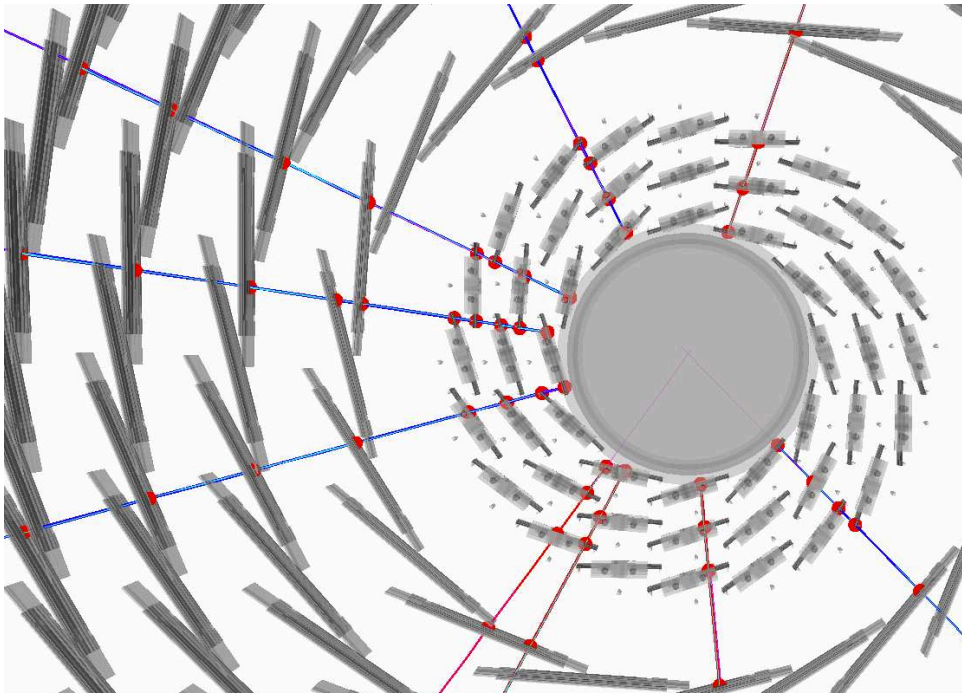
Updates since last week

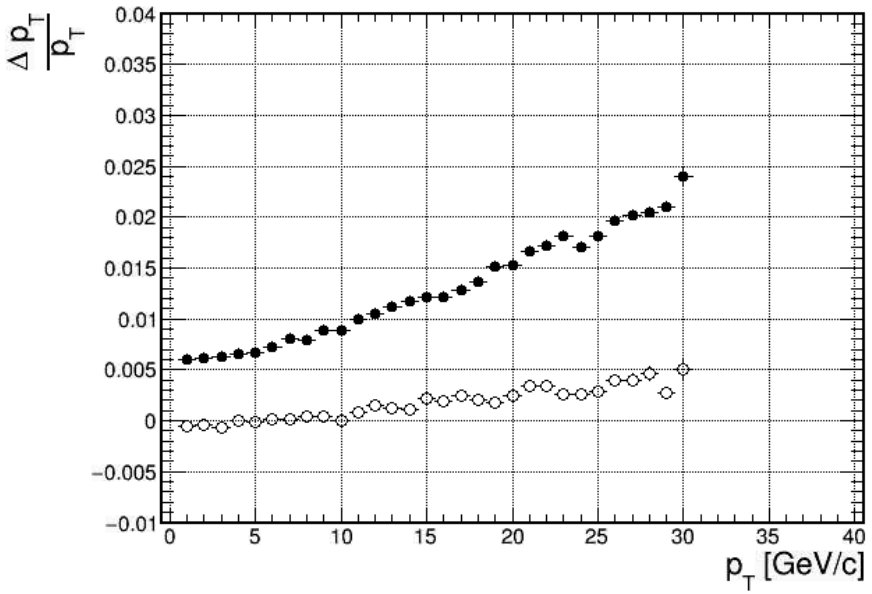
- Seeds cleanup
  - bin seeds by phi, eta, dr, dz
  - merge seeds in neighbor bins
  - largely reduce number of seeds needs to be processed
  - multiple hits in one layer

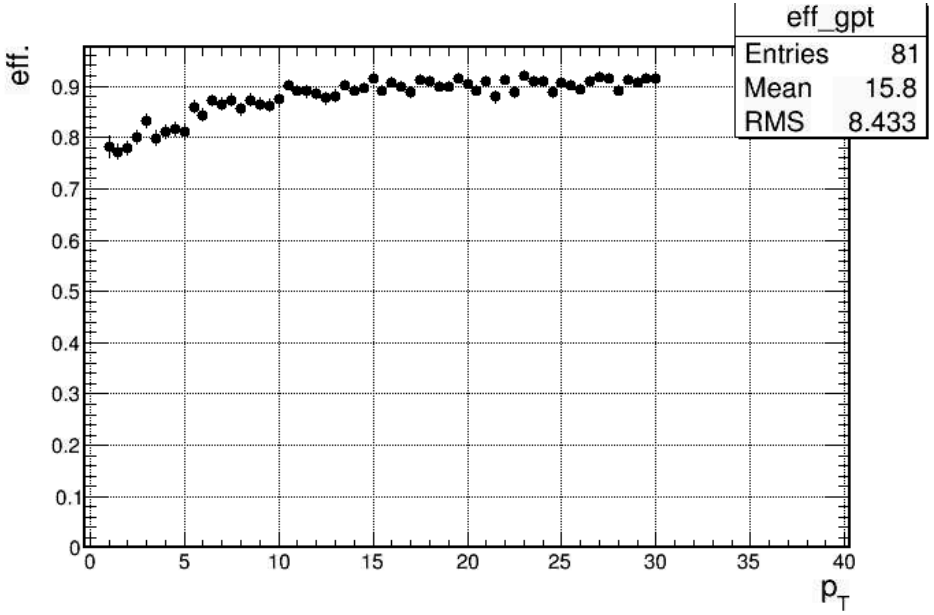
- Norm vector rotation
  - Similar as in the refitting module

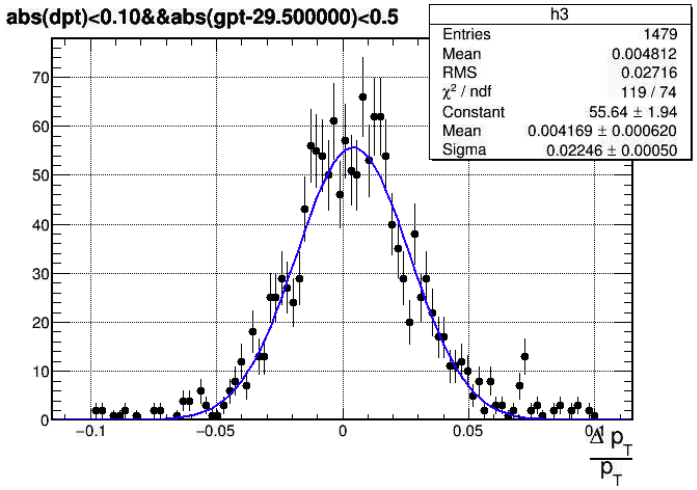
- PHG4KalmanPatRec:
  - https://github.com/HaiwangYu/coresoftware/tree/KlamanPatRec



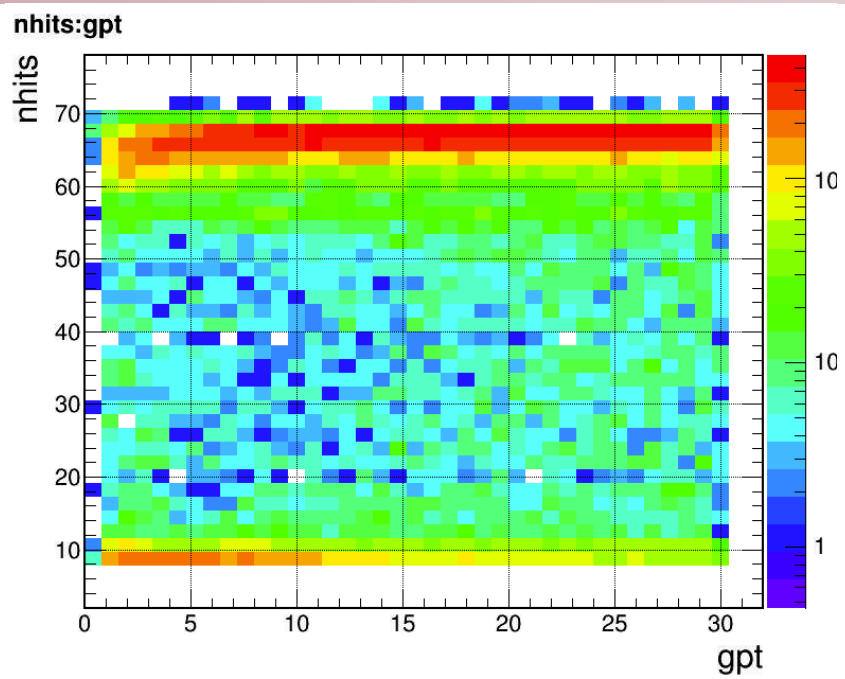
Performance, ana.49



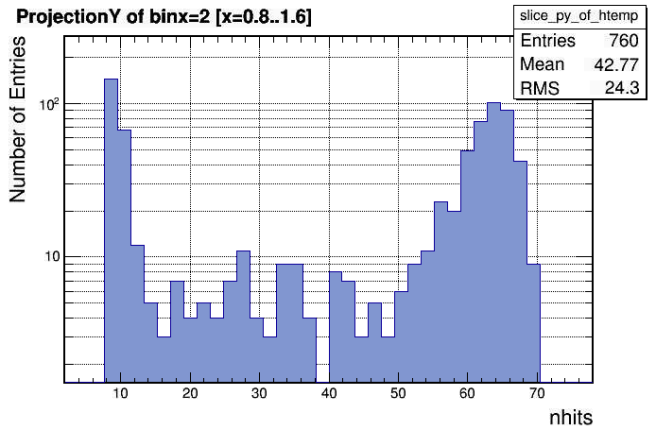




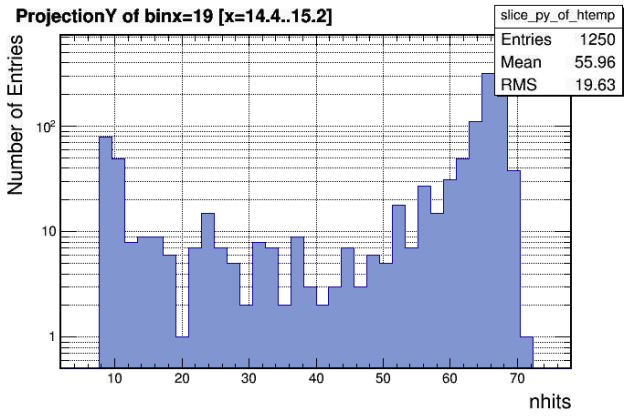
Cluster association



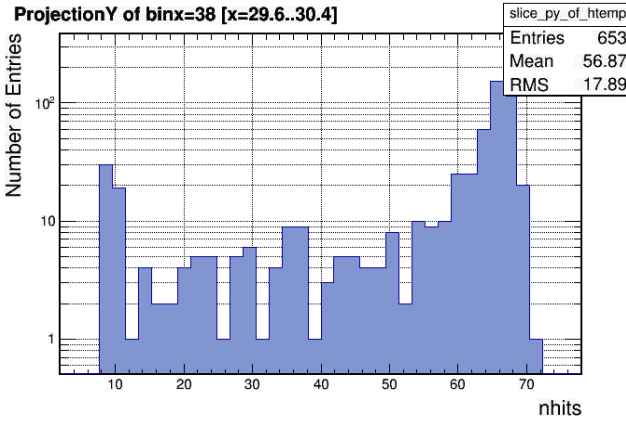
1GeV



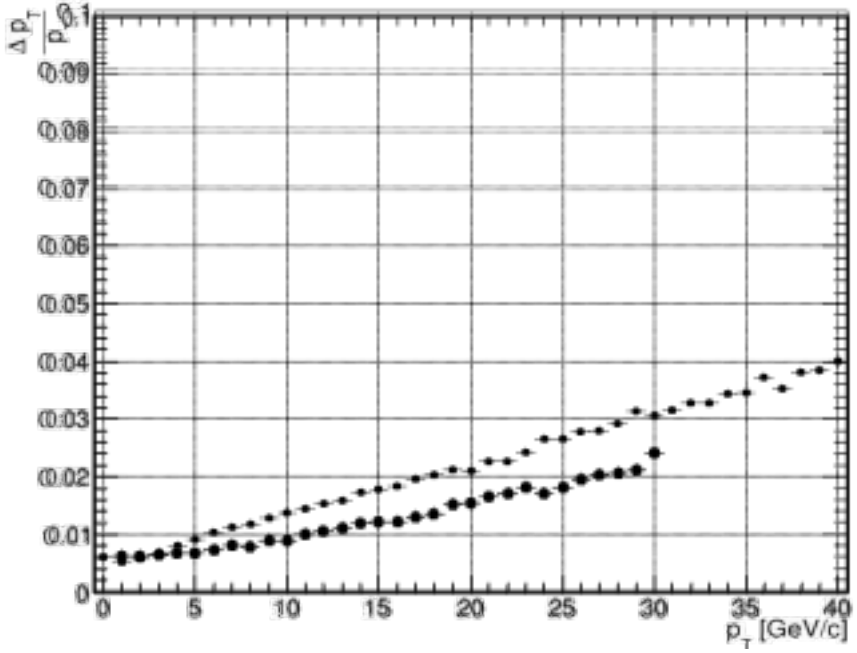
15GeV



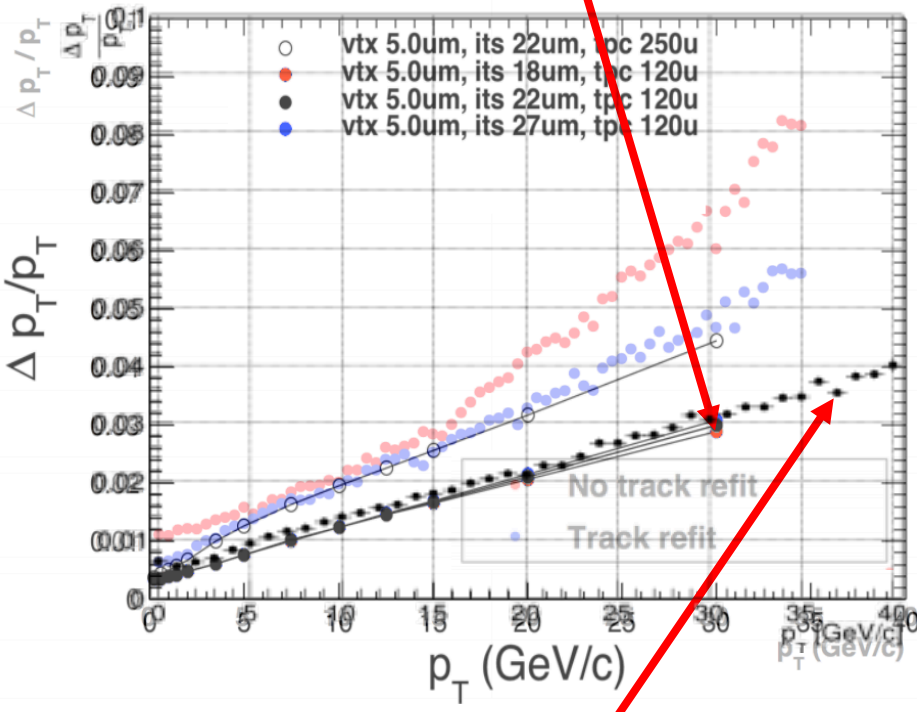
30GeV



Comparison

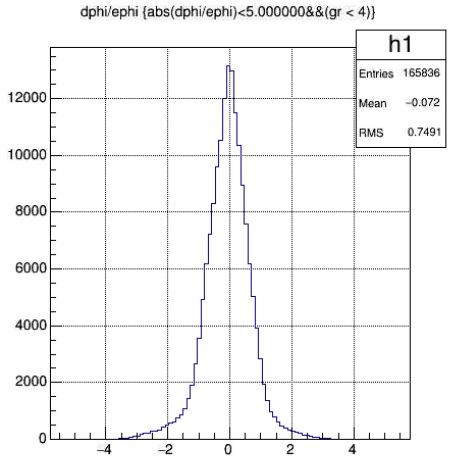


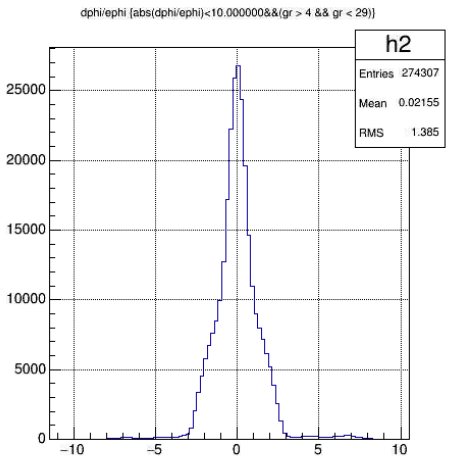
Bench mark: ILC Kalman filter by Christof Roland

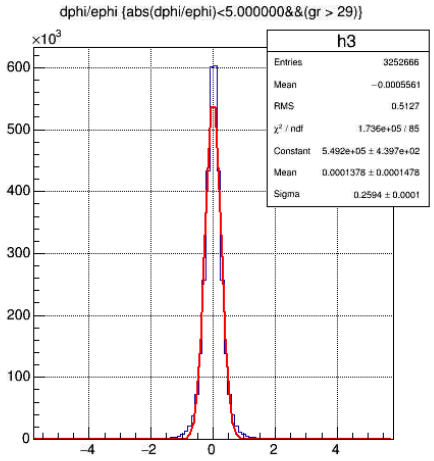


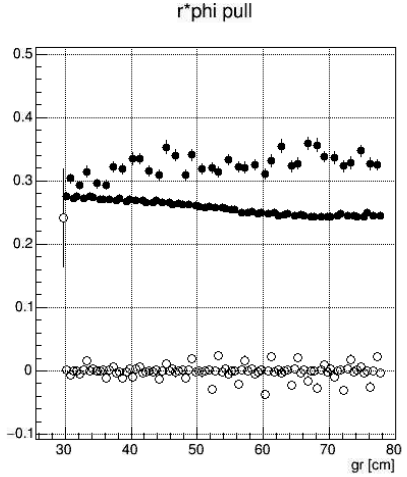
New: Geant4 + Ideal Patter Recognition + Full Kalman fit (GenFit2)

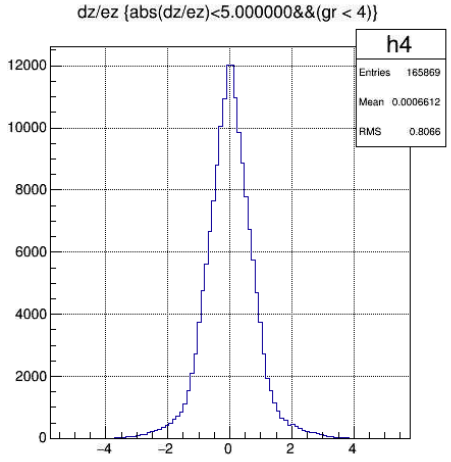
ana.49

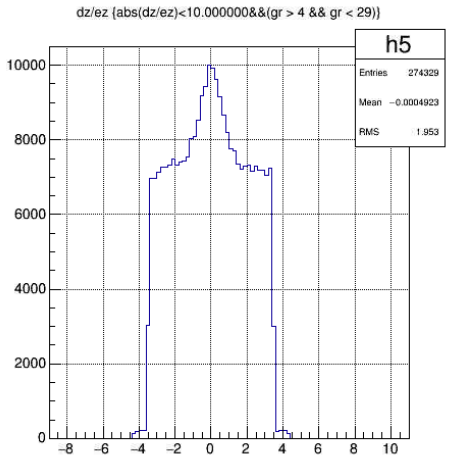

dphi/ephi {abs(dphi/ephi)<5.000000&&(gr < 4)}
h1
Entries 165836
Mean −0.072
RMS 0.7491

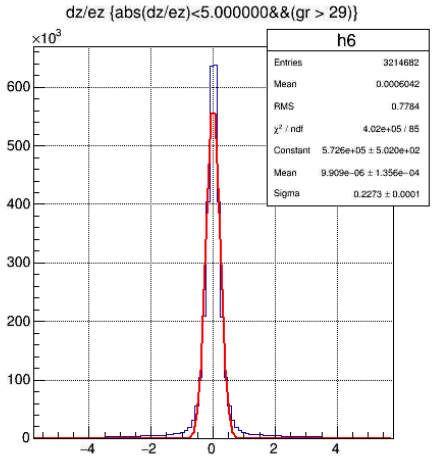

dphi/ephi {abs(dphi/ephi)<10.000000&&(gr > 4 && gr < 29)}
h2
Entries 274307
Mean 0.02155
RMS 1.385

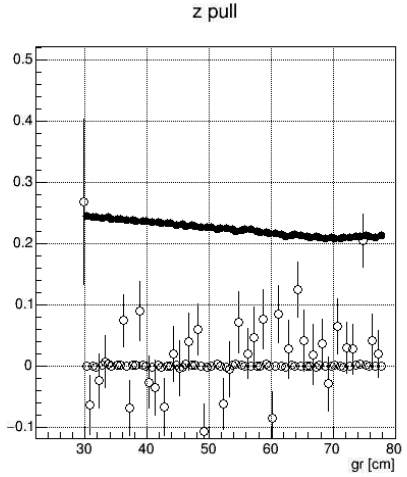

dphi/ephi {abs(dphi/ephi)<5.000000&&(gr > 29)}
h3
Entries 3252666
Mean −0.0005561
RMS 0.5127
χ² / ndf 1.736e+05 / 85
Constant 5.492e+05 ± 4.397e+02
Mean 0.0001378 ± 0.0001478
Sigma 0.2594 ± 0.0001


r*phi pull
gr [cm]


dz/ez {abs(dz/ez)<5.000000&&(gr < 4)}
h4
Entries 165869
Mean 0.0006612
RMS 0.8066


dz/ez {abs(dz/ez)<10.000000&&(gr > 4 && gr < 29)}
h5
Entries 274329
Mean −0.0004923
RMS 1.953


dz/ez {abs(dz/ez)<5.000000&&(gr > 29)}
h6
Entries 3214682
Mean 0.0006042
RMS 0.7784
χ² / ndf 4.02e+05 / 85
Constant 5.726e+05 ± 5.020e+02
Mean 9.909e−06 ± 1.356e−04
Sigma 0.2273 ± 0.0001


z pull
gr [cm]

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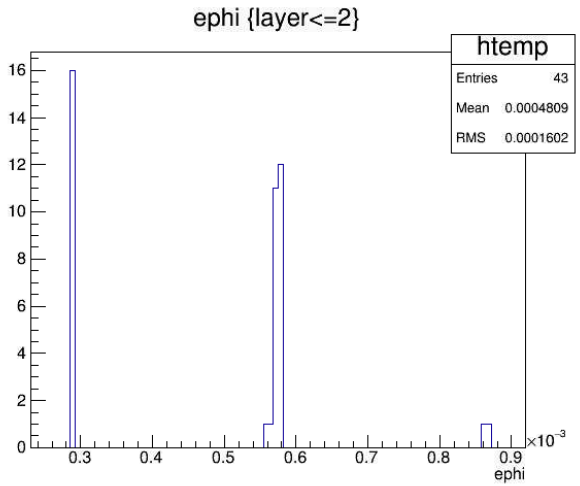
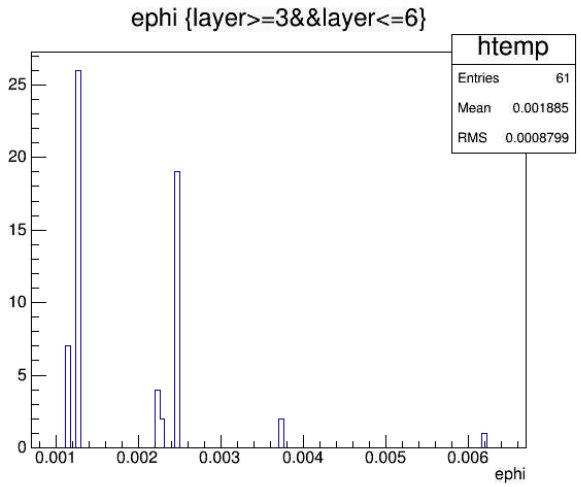
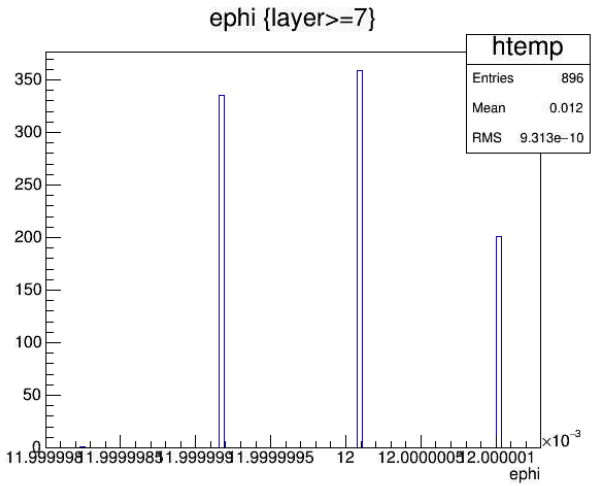
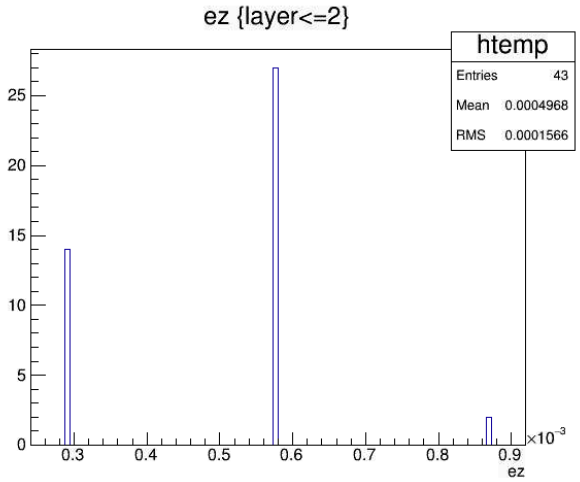
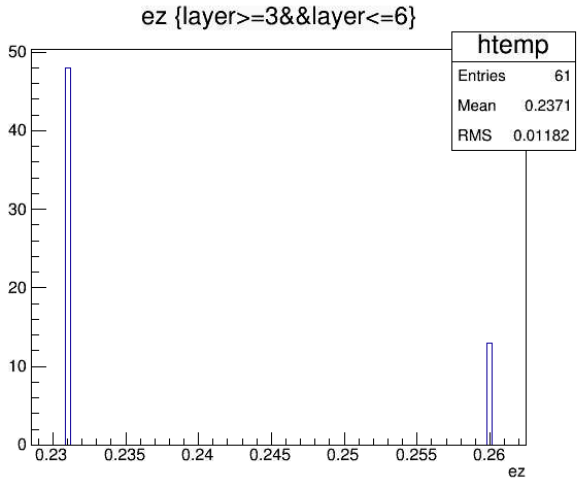
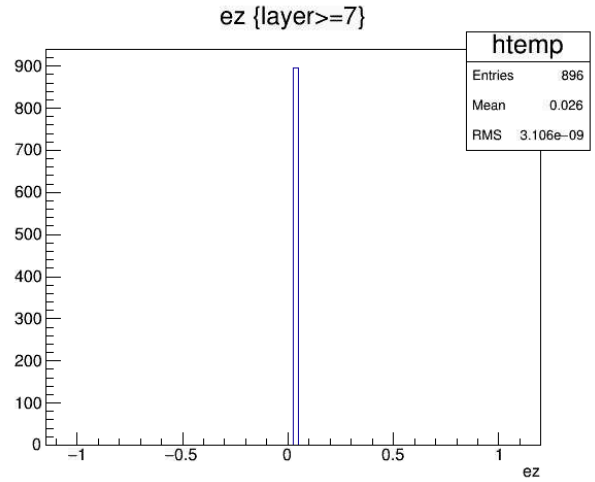

ephi {layer<=2}
htemp
Entries 43
Mean 0.0004809
RMS 0.0001602
ephi


ephi {layer>=3&&layer<=6}
htemp
Entries 61
Mean 0.001885
RMS 0.0008799
ephi


ephi {layer>=7}
htemp
Entries 896
Mean 0.012
RMS 9.313e−10
ephi


ez {layer<=2}
htemp
Entries 43
Mean 0.0004968
RMS 0.0001566
ez


ez {layer>=3&&layer<=6}
htemp
Entries 61
Mean 0.2371
RMS 0.01182
ez


ez {layer>=7}
htemp
Entries 896
Mean 0.026
RMS 3.106e−09
ez